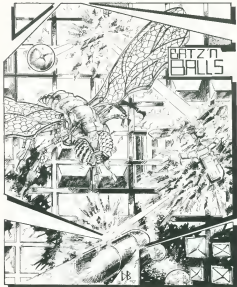


ISSUE 14

JUN ~ JUL

£1.20

ZAT



FOR SAM COUPE & SPECTRUM

CONTENTS

GENERAL

- 2 EDITORIAL
- 4 RESUBSCRIPTION DRIVE

COMPUTER

- 3 SOAPBOX Pornography on Public Domain
- 5 BACKCHAT Other programming languages
- 8 PLAYPEN Bat'n Balls Rainbow Islands and

- other reviews with Polly
- 12 PUBLICA DOMINIUS Introducing PD's new SAM writer Mike A J
- 13 FEATURE: World of the Spectrum
- 15 NEWSFLASHES The ZX92 REPORT
- 19 ARCADE ALLEY

- 21 CHIPSHOP
- 27 MEAN BIZ Review of the Sound Machine and Spectrum loaders
- 27 SPLIT SCREENS

Cover by D Blackburn



EDITORIAL

by D BLACKBURN

Firstly, two apologies: a) for the lateness in sending out last issue. Now whether yours superstitious or not I don't know. As if was putting last issue together was hindered by all manner of problems. From myself coming down with a very bad case of head flu, our local printer's machines breaking down (and themselves overloaded with work for the Election, which caused a delay in receiving our printed issues back), which leads to b) for some of last issue's pages being of very poor quality, which we hope to make amends in future issues and other nipping calamities.

We aim to ensure, and promise to all our readership, that no issue of ZAT will be late again. To keep this promise, we've made a slight alteration. This should be a MAY/JUNE issue, not a JUNE/JULY issue. So why aren't we covering May? Well since other mags date their issues a month ahead in relation to the month

to the month an issue is actually released, we've decided to do the same. So from now on, expect every issue to be despatched/available within the last week, every 2 months. Continued? I hope not.

So what's in this issue. Well apart from the regular sections, there's a article on how the Spectrum has spread to a worldwide audience of users. In fact this issue is geared towards the Spectrum fraternity slightly more than usual as this issue (in a preview format) represented ZAI at the ZX92 convention in Cambridge to celebrate 10 years of Spectrum computing. David attended the event and a full report is featured this issue.

Also I'd like to welcome to ZAI the lucky readers who won our free subscription via Y8's Fanzine Competition. We're hoping to run more competitions like this to boost readership. Speaking of competitions, remember this is your last chance to enter our Mario Minor competition and win a signed copy of the game.

Next issue's Editorial I will be making a "major" announcement as per ZAT. So until then, take care and see you soon. CB

ZAT 12 JUNE/JULY 1992 Price D Blackburn, Artwork Tech Editor, D Ludlow, Advertising/P, D Ludlow & P Sheppard, Print, Frederic M Galtier, CONTRIBUTORS: M Schuler, P Swann, S Kemp, D Addy, A Davis, D Carson, BBA, A J & S Wilson.

Printed at Mordley Peoples, Cover by Rob and Gary. Next issue is due out on the 28th July.



And now for a less than average (?) look at the problem of porn on PD...

Yes, they're all talking about the latest 'teen' menace. In the '50s it was 'horror comics', in the '60s it was listening to pop pirate radio stations, in the '70s it was football hooliganism, in the '80s it was heroin but now in the 1990's it is computer porn!

Another media inspired problem perhaps? How many of the teenagers who might now be tempted to seek out porn disks only do so because grubby minded, alcohol soaked hacks have decided to turn their purulent attention onto what is admittedly a problem, but a relatively minor one? - Ablest until the tabloid press and lightweight magazines for bubble brained airheads get hold of it and blow it out of all proportion!

A lot of nonsense has been spouted about the evil pornographers who are spreading porn on PD disks. - Er, hold on folks! PD disks should be either free or very low cost. People who produce and sell pornography are in their business for the same reason that other people sell, for example, bicycles. They have perceived a market need for certain products and have decided to make money supplying these products or services.

People who sell bicycles won't give away their wares and neither will people who sell pornography. Whether we like what they sell or not, pornographers are after all, business people.

No, the people behind these porn disks are silly little boys who probably will never grow up and who have more high tech computer equipment than is good for them.

I can just picture the scene in some bedroom in - what shall we say? Suburbville. 'Cor Baz, I've just had a mega-brill idea. You know that hard core book you've hidden under the floorboards, why not see if we can digitise it?'

That worked, so they started to swap them with their equally brain devoid spotty little mates, progressing onto other, 'greater' things, digitizing stills from a porn video that they had swapped for a pile of Balmain comics. Then their over-indulgent and unaware (uncaring?) parents splashed out on the necessary equipment to begin having moving hard-core porn on their computers! - Gosh how exciting...

Perhaps various vice squads would like to investigate some of the more blatant PD libraries and remind them that PD means Public Domain and not Porn Dealer!

Some of the articles in the press (if we can call it that) mention that the spotty little kids from the planet Acanth are doing out pornography involving animals. Perhaps the RSPCA would like to investigate these PD libraries, too? (Animals have enough problems with being gassed, hunted, used in vivisection labs, etc without having to put up with this kind of abuse.)

But the kicker is this... Where do the porn images come from? From published magazines and videos. Normally, people who have copyright material ripped off in such a blatant way would sue. A word of warning to any spotty little herbal who is sniggering as he posts off or sends

more ripped off porn down the wire. Hard core porn is illegal in Britain. So those who deal in it or produce it are criminals. If (WHEN?) they found out who you are, they may well come round to your house armed with a sledge hammer and a blow torch - one for you and one for your computer. Perhaps you'll get to choose which one they use on you? I sure as hell wouldn't like to be in your shoes, boys!

Don't forget readers, if you want a chance to air YOUR views or opinions in ZAT's SOAPBOX, or you have an issue you would like to pass to Martin to look into, please write to ZAT at the usual address, which of course is
**ZAT
103 CHILTERN GARDENS
DAWLEY, TELFORD
SHROPS, TF4 2QJ**

ZAT RE-SUBSCRIPTION DRIVE

This issue marks a point where many ZAT readers are due to re-subscribe, as they have now had their full years worth of magazines.

To re-subscribe to ZAT, for a full year (6 issues), now costs £7.20 - or £9.00 in Europe. However, as we are fairly kind and generous (if not particularly rich) sorts, we'd like you to feel that you are getting even more of a bargain by taking out another subscription. So, listed below are the benefits that ALL subscribers are entitled to, now and in the future:

- 1) A full year of ZAT! This includes FREE technical help, friendly service, and all that you know us for!
- 2) Discounts on certain items advertised in ZAT. This will include more items in future issues, as we are stipulating to all new advertisers, that they should put a ZAT Subscribers offer, with their product.
- 3) Discounts off all ZAT related services. SAM Quarter, the Spectrum equivalent, Quest Software Adventures, Demos, etc.
- 4) Plus other ideas, still on the drawing board!

Answer this question correctly when you resubscribe, and you could win a prize!

What was the real identity of former ZAT Adventure section writer, Andrew Vincent?

So, JAT send your new cheques to:
**ZAT RE-SUBSCRIPTION DRIVE (14)
103 CHILTERN GARDENS
DAWLEY, TELFORD**

Please make cheques payable to ZAT, and PLEASE list your computer system (Computer/s, drives, printer, memory, misc. interfaces, modems, etc) and interests, likes, dislikes etc.

Don't delay - write today, right away!

Back-chaT

BY ANDY DAVIS

Last issue, we introduced the new command called PAUSE. The task of this is to wait for a brief period, the number after the command determining its wait period. However, as some computers call their PAUSE command WAIT. Both mean the same thing. Also beware of the number following the command, as the numbers aren't seconds. The compute finds seconds very slow, so it works as fifths of a second (or sixths of a second in the USA). So 50 50ths is one second, 100 50ths is two seconds and so on. 75 would be one and a half seconds. Using numbers like this means you can accurately halt the computer for very small, accurate lengths (or shorts) of time. The most common occurrence for a wait period is usually one second (50).

Let's take a break from programming for the rest of this issue and move away from BASIC and look at what else the computer can offer.

99% of all 8 bit computers come with BASIC as standard as it's cheap, easy to learn and is usually bog-standard, so almost any basic programs will convert onto another machine with little or no modification (usually sound and graphics, where all machines differ).

In 1984, a new machine came out on the market, called the Jupiter Ace. This machine was made by some designers of the Spectrum and looked uncannily like a fusion of the Spectrum and ZX-81 in a white case. The major difference was that it didn't contain BASIC, but FORTH.

FORTH has the advantage of

customisation and power. You can create your own commands (very much like the PROCedures) and complex programs can be written in just a few lines. Sadly, FORTH is difficult as well as complex for new users. There are no line numbers and programs are run in a top-down fashion. The good thing though, is that programs written in FORTH are easily transportable to other machines as there are defined standards of the language, like FORTH-79, FORTH-83, PigForth and PolyForth. The only slight differences are that the newer FORTHs have better commands to process data. These commands can be emulated on older versions by just defining a new command. If you're interested in creating your own customised keywords and functions, then this is for you.

PASCAL is very much a beginners language. It, unlike FORTH, is very much like BASIC, but doesn't feature line numbers. The idea of Pascal was to teach students to use the top-down fashion of programming and to not go leaping around programs with unwanted GOTOs and GOSUBs. Pascal centres itself around its procedures and its main advantages are for graphics and visual use incorporating powerful programs. The only problem is price. Most languages come equipped with a hefty price tag on them. Also, you've probably noticed that support for utility software has dropped to around 10% at your local store. The only place I can find Pascal (The Hooft version) is from TurboSoft. Give them a ring on 0525 377974. You will usually find an advertisement and price list in Y.S.

[Hooft can be contacted on 0525 71888, or by writing to The Old School, Greenfield, Bedford, MK45 5DE. They still supply both PASCAL + C for the Spectrum, and they also supply these and other languages that run under the CP/M Disk system. These MAY work on SAM under the new PROCos system.

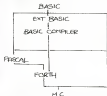
We'll let you know if they do, soon! DL)

Stick With Basic

BASIC is an excellent beginners language and I'd recommend learning BASIC before moving on. But it's slow and sometimes lacks useful commands, so what do you do?

The Tree of Knowledge

Here is a tree structure of the logical steps to take when progressing through the language world.



Start at BASIC. If you want to stick with it a bit longer, but would like more commands and a little more speed, then get an extended BASIC program. An ideal one for the Spectrum is BetaBasic. SAM owners have all the features of Spectrum Basic and BetaBasic. Ocean's Laser Basic and Scope2 are other examples of extended basics which are primarily used for games writing.

The next logical step is a compiler. This has to be one of the most useful utilities available. What it does is converts your program into machine code! So, no learning code, just write in basic and convert! The only disadvantage with this is that the compiler (which reads your program and turns it into code) may take up some vital memory, leaving only

around 20k for your program. Some compilers also need an operating routine which needs to read the compiled code and turn it into something meaningful the computer will understand. There are quite a few still around. The first is ZIP, featured in the first few issues of Your Spectrum. This was replaced by ZIP2 which was available on the Crash Tack Tape. The latter needed an decoding routine to convert the compiled code into code the computer could understand. Woder3 is available to inspect from the Spectrum Software Hire club. You can find the address in AkkNews. Then there's Hsoft Basic, in my opinion the best compiler ever. The 48k program takes up only 11k and the code generated can be located anywhere in RAM, even where the compiler is! The 128 compiler is stored in read-only and takes up only 500 bytes of normal ram!

Hsoft is a "floating point" compiler. In laymans terms, this means it can deal with numbers from 0 to 65535 and -32767 to 32768 as well as decimal points. This is where it has the advantage over other compilers which can deal with whole numbers only between 0 and 32768. It also comes with a comprehensive manual and lots of demonstration programs. The compiler is accessed by pressing both video keys on the 128 to get a menu or by simple + commands on the 48. (Eg +C to compile) You decide where you want to compile your basic by popping in a REM OPEN to start compiling and REM CLOSE to stop. Then, the compiler will convert the basic between these two statements only! The speed at which the basic is converted to code is phenomenal and it finds errors and bits which can't be converted, like all tape commands and some RESTOREs. The last quoted price from TurboSoft was £18.99, but ring first to check.

Compilers have many pros and cons and its best to try one first before you

key. Nearly all will show significant improvements in speed when calculating, but beware, because when using graphics commands, most compilers just send them to the ROM graphic drawing routine which is just the same as typing your PLOTs and DRAWs in BASIC. Some compilers might feature a new drawing system in their code, but this runs down the amount of bytes free for your program and may need a large amount of code in your otherwise small compiled program. A good way to check the speed of your compiler is to use the 'screen move' method...

First, find 7k of free memory for a screen. If your compiler is stored at the top end of RAM, then use a low address, like 40000. If, like ZP2, the code is at the bottom end of RAM, use a high address like 50000. But be careful you don't put your screen where your program will be compiled to!

When you've arranged a suitable area, type LOAD "CODE xxxxx" and load in a screen where xxxxx is the address where you have 7k of free memory. On Hest's BASIC, xxxxx=30000. Now, type this short program...

```
10 BORDER GRAPER GINK 7CLS
20 LET F=6384
30 FOR T=xxxxx TO (xxxxx+6911)
40 PORE F:PEEK T
50 LET F=F+1
60 NEXT T
70 STOP
```

On Hest's, add 1 REM \$OPENE and 80 REM \$CLOSEE RUN the program in standard BASIC and see how long it takes to 'load' in the screen. Now, compile the program and call the compiled code. What a difference!

If you don't own a compiler, or extended BASIC then I suggest you do, or at least borrow one to see the

advantages and extra speed it puts into your programs. If you would like to quest into machine code, well, good luck! The first steps I would take is try and buy some old computer magazines from when the Spectrum was young, like Your Spectrum and Your Computer.

In the early 80's, there were many good books around published by Melbourne House, like 'Spectrum machine language for the absolute beginner' by William Tang (ISBN 0 0664 10 1) or 'Supercharge your Spectrum' by David Webb (ISBN 0 0664 112 8) or 'Mastering Machine code on your ZX Spectrum' by Tom Baker (of Your Spectrum and ZX Computing) (ISBN 0 90563 23 6) published by IP. You can't buy these books any more and are considered quite valuable, but check out the computing section of your local or city library as you'll probably find a copy there. Do the same if you want to know more about Basic, Pascal, Forth or any other language you're interested in. Try contacting the program's authors or publishers if they still exist for usergroups. AlchNews is running a Compiler user group for any owners of any compiler or extended basic utility. If you have any compiler and would like to contribute, then get in touch, but please try to enclose an SAE to guarantee a reply. The address is...

Alchemist ResearchSpectrum Support Group
or AlchNewsSpectrum FREE tapeware
62 Tiffe Barn Lane
Woodhouse
Sheffield
South Yorks.
S13 7LN

Next Month I'll move onto the graphics systems of your computer. If you would like to read more technical data, then subscribe to Alchnews or read MEAN BEZ in this magazine.



PLAYPEN

compiled by
POLLY SHEPPARD

NOTE: Due to technical problems, part of this page wasn't very legible to send. To make amends, here's what very came into by Polly and review of The Match on all these pages.

My name is Pauline Anne Sheppard. It is now my task to compile PLAYPEN and the game reviews that are

featured every issue. The Editor had been trying for some time to find a willing volunteer to do the job, but no one else but myself wanted the job so here I am. Now let me reveal my secret: I don't play games, neither do I own a games machine in fact I own a Amstrad PCW 8258 now happily please!

I will only add that I am a secret games fanatic, and the PCW prevents me from spending whole days in front of a screen filled with fantastic creatures, facing impossible odds, and eating the most revolting things! I was taken to Blackpool last Autumn, never again! I spent pounds in a space simulator, from which I had to be physically extracted by my fiancé, after threatening the owner if he dared to turn it off! I cannot count the number of dead and injured throughout the arcade as I ejected bewildered children off simulations of "Space Shuttles" and "Formula One" racing cars.

Games: I love them! So you ask how will I be able to handle game reviews. The simple answer is that I do not. As I stated I compile the reviews kindly supplied by other game fanatics who have done, and continue to do, game reviews for this column.

In this edition of Playpen, my merry band of reviewers have looked over Rainbow Islands, The Match, Hard Drive and the latest SAM game Boltz n' Balls. Something I want to bring to your attention is this. When we review a Spectrum title has been reviewed on the SAM, we've included a special emblem to indicate that this game is SAM compatible. However some titles maybe SAM compatible even if reviewed on the Spectrum. So if for any reason we don't indicate this, and you know otherwise, please write in and let us know!

The Match (Spectrum) Cull Games £3.99

Review draft by Stephen Mullen

The review for this game leaves me wondering if food is not more important than the match? Managing a football team must be bad, but playing this game must be a nightmare. The game tackles the problems off the pitch as well as on it. How to afford the best players, ground maintenance and the possibility of a riot caused from a lack of pies!

Winning matches is apparently only half the job. Your team must bravely win promotion from the fourth division, taking that a personal reputation can be gained, leading to others from other clubs. If staying with the underdog is your style, then you have the chance to turn them into world beaters.

There is a long line of Football clones for the Spectrum, but The Match is well put together, and not written in BASIC, like so many others. You may scout for talent, improve your ground, sack players, buy pies (sorry) all the usual stuff. The graphics are good and involvement high. What else do you need?

This game comes highly recommended, not as a master piece of programming, but as an addictive and enjoyable game. A bit like pot really.

RATINGS

PLAYABILITY 80% ADDICTIVENESS 87%

GRAPHICS 40% SOUND 30% *OVERALL 80%*

Hard Drivin' (Spectrum) Hit Squad

£3.99

Review draft by Richard Seward

Driving is a skill that most of us have, but few of us can master. Anyone can drive down to the shops, but try navigating some of the Welsh mountain passes (I've seen a fair few of them) to get a feel of where skilled driving comes into its own. If you haven't got a mountain range next door, this game is the next best thing, or perhaps even better!

Hard Drivin' puts you in the seat of a stunt car racer, with a speed track and a stunt track (going ahead). All you have to do is turn the key, put the car into gear, move off and you're away. You then have to navigate either the speed track (in which you have to go round as fast as possible), or the stunt track (in which you must perform a variety of stunts). If you manage to successfully complete a lap, you get to race a computer car in a headlong duel.

Of course there are certain hazards to worry about, the main one being crashing. If you veer off the road for too long, the computer will automatically put you back several hundred yards (not a desired thing, since there is a short time limit for you to complete a course), after showing you an action replay from an elevated side angle to highlight your embarrassing failures.

The stunt track provides several problematic stunts which you must successfully overcome to stay on the road. First of all, there's the bridge. This is a swing bridge which is half-open. You have to go over it at the right speed so that you clear the gap in the middle of the bridge, but don't go too fast that you become airborne! Secondly is a 360 degree loop-the-loop. Here, you have to go as fast as possible if you want to stay on the obstacle! Thirdly, there's the problem of negotiating a very steep downhill bank: too fast, and you'll launch into the air and crash, too slow, and you'll run out of time.

Any mishaps you may have with these obstacles result in going back before the obstacle, requiring you to try again, and thus losing time.

The original arcade game coin-op features a cow on the road, but I can't say I encountered any four-legged obstacles as I went around.

The graphics for the game are great. Obviously "borrowed" from the Freescape games, they feature a full 3-D view through the windscreen. Furthermore, the action replays are shown from a third person's point of view with equally strong animation of the car. Certainly watching the car loop-the-loop both inside and outside is well worth watching. And unlike Freescape the graphic frames are updated fast enough to give realistic real-time motion (which wasn't as important in the Freescape games).

The main fault with the game is the control method. The arcade machine was highly responsive, but because the controls were layed out in the same way as a car, you'd expect it, and be able to drive in a relatively straight course. On the Spectrum, things work very differently. Pressing right turns the steering wheel right, while holding it down turns it more strongly. Naturally if you want to stop moving right, you have to counteract the movement by feeding back the steering wheel to the centre. The same is true for the Spectrum controls, but it doesn't seem right when you're using two keys to control the car, rather than an analogue input such as a steering wheel.

I held down right and the car jerked left. Then I held down right to counter-act the counter-reaction, and so on ad infinitum. Perhaps a diagram of a steering wheel with the position of your hands marked (such as that in

Test Drive) would have been a good idea, or an idea of using the top row

representing "left" and "right" to varying degrees, and by testing a self-staple in between the '5' and '8' keys, the testing of a steering wheel would be given. As it is, I'm afraid the great graphics are ruined by the unworkable control method.

The only other complaint is the sound, which is totally absent on the 48k and an annoying drone on the 128k.

All in all, I think this game looks great, but play it and you'll end up getting very frustrated. However, I must say that this made the game addictive in some respects.

Convertible

RATINGS

PLAYABILITY 55% ADDICTIVENESS 63%
GRAPHICS 90% SOUND 35% **OVERALL 63%**

Rainbow Islands Spectrum Hit Squad
£3.99
Review draft by Richard Swann

This is definitely one of the best Spectrum re-releases I have seen yet. In case you didn't know, the game received rave reviews from all magazines and was rated highly in the top 100 games in both Crash and Four Sinclair. But has time been good to the game? Read on.

The game consists of seven islands, each divided into four rounds. The object of each round of the game is very simple: just get from the bottom to the top of the screen in as short a time as possible. This would be easy were it not for the fact that there are lots of nasties patrolling each level. Fortunately, you are armed with an endless supply of rainbows, which can both kill these creatures and provide extra platforms for you to make your way to the top level. You'll have to hurry though, because after a short time the water level at the bottom of the screen starts to rise, and you'll drown if you don't make it to the top in time!

If you can trap a baddie inside a rainbow, you can be awarded with special options such as extra speed, quicker rainbow throwing and multi-rainbow power. You'll probably need all these to overcome the gigantic guardian at the end of every island.

The graphics and gameplay are both excellent. Colour is used extensively and without any clash at all. The characters in the game are all well animated and there is good 128k fun as well (although this gets annoying after a while). Even when many characters are on the screen at one time, it is still easy to distinguish who's who. The game is simple to get into, and extremely addictive, because you always want to know what happens next. I would, however, recommend using the keyboard, as jumping using the joystick can cause some problems. There is no option to define keys, but two possible layouts are available.

If you haven't already got the game, rush out and buy it because it's just as good now as when it was first released!

RATINGS

PLAYABILITY 67% ADDICTIVENESS 97% SOUND 65%
GRAPHICS 85% **OVERALL 83%**

Whatever the computer, there are a number of arcade classics that exist in one form or another on it, such as Space Invaders, Pac-Man, Asteroids, and of course Breakout. The Spectrum has had a multitude of great (or should that be smashing?) Breakout variations: Arkanoid and Batty, to name but two. However SAM has had none, until now!

For those of you who have been on the planet Zarg for the past 10 years, here's the basic idea. You control a bat by pressing left or a right button. You bounce the ball off the bat, preventing it from hitting the bottom of the screen and attempt to smash all the bricks at the top of the screen into smithereens!

Bats n Balls has been programmed by SAM 'Tetris' programmer David 'Lord Insanity' Gommersan and his fellow members from 'The Lords' PD team. It is his first full-price release, and hopefully not his last.

As with many of the newer versions of Breakout on the Spectrum, BNB also features 'peaches' which just get in the way of the ball and bricks that drop 'peaches'. The peaches include lasers (to blast away the bricks), and level icons (ends each level), a cushion (to allow the ball to hit the bottom of the screen), multiple balls, extra lives, extra speed, etc. However also included are items to kill you instantly and to reverse your movement!

BNB has 160 levels to tempt you with, but also features passwords so you don't have to replay all the levels again when you get killed. However, every six screens, you have a bonus round to save that will give you extra points but it isn't easy to solve! A naster shock occurs every 30 screens but I won't spell it for you!

BNB has great graphics, smooth gameplay, and pretty decent sound. [It also has a, also has a pretty decent cover, but I won't increase Darrin's age by going on about it!] It also works with SAM mouse, and is [apparently] much better for being played with it. All in all it's another excellent release from Revelation so buy it and get 'bating'!

RATINGS

PLAYABILITY	91%
ADDICTIVENESS	82%
GRAPHICS	80%
SOUND	84%
OVERALL	85%

That's it for this month. Next time there will be a review of Astroball, which as you may know is Samco's first Spectrum game release (the SAM version is available soon), and which has fantastic review ratings in the main mag.

Glancing through the news pages, the games that I think are also best buys at present are Midnight Resistance, Puzzle, Castle Master [reviewed way back in ZAT 3], and the Spectrum version of Escape From The Planet of The Rebel Monsters. All of these are by the Hit Squad and all retail at £3.99.

Well, I hope you enjoyed this edition of Playpen, take care and I'll see you all next time. P.S.

PUBLICA DOMINIUS

By Mike A.J. & S. Mullen



This issue sees a welcome return to ZAT's PD column. However, due to David's new commitments with SAMCo, SAM Demo Master Mike A.J. has stepped in to take the reins of the SAM side of this column. The Spectrum side is being taken care of by David just for this issue, but first it's over to Mike -

Yes, that's right, Mike A.J. is now the writer for Publica Dominus. Being a PD producer myself, I know how much (and how little) work is put into a program. Have you noticed how practically all software, PD or otherwise, seems to receive over 70% as an overall rating? Well, this column is going to be different - I shall be reviewing PD by the standard ZAT ratings (graphics, sound, presentation, usability and overall) plus two others: originality and technical achievement. Don't be surprised to see scores less than 30%!

Firstly, I would like to give a new disc mag "PUBLIC" a mention. Yes, I know the SAM already has more than its fair share of good disc-based mags (and many bad ones), but I think Public stands out from the latest releases. Here is the review of PUBLIC 2:

On boot-up you are presented with a screen which has been turned into a sphere by an Enceladus routine. Unfortunately, the effect isn't totally convincing, since most of the text has become mangled. Now onto a nice standard menu (ie like FRED) with all the usual options. The NEWS section was quite refreshing written in a chatty style. REVIEWS featured

detailed reviews of The Sound Machine, Enceladus B, Voad and SAM Supplement B. As far as the slideshow is concerned, 2 pictures stood out from the standard ST-ports - one from Shadow of the Beast, and a detailed but rough digitized shot of a Fractura camera.

but the highlights of the disc are to be found in the EXTRA section; first is SIGNAL 3 - a 4 part music demo, ported from the Spectrum (European text). Then there is TETRIS 2 by The Golden Triangle (music by Frantisek Poka). It has a simultaneous 2-player option, superb 'Russian' in-game music and normal and wave modes (eg get 10 lines, survive 20 seconds etc). This game is on a par with Lord Infinity's original masterpieces, and is far better (especially on competitive 2-player mode) than most full-price games. Also in EXTRA are DA COPPER 2, a debugger which needs MasterDOS; and BALLS 2, rotating balls which make lovely patterns (as in Enceladus 5).

Also on the disc are 3 sample demos, each about 10 seconds long and don't need a sound sampler attached. But the quality is poor, and the samples weren't expertly timed.

Overall, PUBLIC 2 is an absolute bargain at £1. If only for TETRIS 2! Graphics are fairly standard throughout (and SCREEN are compressed), with sound being very good from SIGNAL 3 and TETRIS 2. The presentation is mediocre, but will doubtless improve (remember FRED 2). With more contributions, PUBLIC looks set to become the next FRED! So, to the scores:

GRAPHICS: 55% (some nice stuff, but some poor ST-ports)
SOUND: 75% (original tunes in SIGNAL 3 and TETRIS 2)
PRESENTATION: 30% (no use of graphics except the menu)

LASTABILITY: 80% (TETRIS 2 is just as addictive as TETRIS)

ORIGINALITY: 40% (looks very reminiscent of FRED)

TECHNICAL ACHIEVEMENT: 50% (besides the EXTRA section, nothing worth mentioning)

OVERALL: 80% (outstanding value for money, with a superb game. Buy it!)

PUBLIC is produced by Sam Buchanan with contributions from Thorsten Gudmundsen. Contact Sam at PUBLIC, 8 Suthmere Drive, Burbage, Nr. Marlborough, Wiltshire SN8 3TG.

And now, it's back to David!

Thanks Mike. Well, since my outburst several issues ago, when I was getting rather irritated over the lack of Spectrum PD, I have been forced to swallow my words yet again! This time, it's down to Tim Kemp -

As many of you know, Tim - as well as being Adventure Columnist for YS - also runs a Spectrum Adventure related fanzine, From Beyond. However, did you also know of From Beyond PD?

FBPD (for short), has a range of inexpensive PD Adventures. All the games cost a mere 99p (plus stamp) - including multi-part games! When you consider the prices of tape, plus the clear Mac-Printed covers the games come in, that's pretty cheap indeed!

A full review of some of the games available, will appear in Mind Games within a few issues. But in the mean-time, contact Tim for more details at

35 Globe Place, Norwich, Norfolk, NR2 2SQ.

However, from what I can tell, FB are the only people producing PD Adventure software for the Spectrum. If you know any different, please let ZAT know.

The Wonderful World Of The Speccy!

By Richard Swann

The Spectrum doesn't have much a hold of the British market anymore, perhaps due to Amstrad's plan to kill off the Spectrum, which is a great shame, and perhaps due to the fact that the SAM isn't as nearly as well known as I have hoped it would be by now.

Fortunately, there appears to be a large market for the Spectrum abroad, which may seem rather odd, but is great news for British Spec-chums desperate for some new action on their machine.

The best countries to find some overseas action have been Spain, Russia and South America.

The connection with Spain has a lot to do with Sinclair's market plan, which concentrated in Spain as well as in the UK, thanks to a co-operation with a Spanish company, Investronica. At the time, this was a wise deal, as Spain had a penchant for marketing computers of any description, due to its desire for technology. At the time of the deal (mid-1985), Sinclair's sales were as good as even, but in fact, Sinclair Research were on the verge of total collapse as a consequence, the deal perked up Sinclair's business position for a while.

Some of you may remember the Spanish LMS Spectrum which appeared at the end of 1985. This was due to a joint effort programme between the two companies over a period of six months. As a consequence, the Spanish market was treated to the Spectrum before the British were, due to the ability to manufacture and distribute it there. It was only until importing costs had been sorted out, that the machine was released here in March 1986.

As a result, there is a lot of Spanish Software about. Most of the Spanish software that finds its way across to the UK has come from the software house Dinamic. Dinamic's first games appeared at the end of 1985 in the UK on various labels, before moving to Ocean, and later establishing a UK base with Electronic Arts as distributors. His games include West Bank, Army Moves, Game Over, Freddy Hardest and Duxio. The only trouble with Dinamic Games is that they're hard. Ridiculously hard. In fact, pretty damn impossible. Most of them. I remember being stuck on screen one of Army Moves for six months, until I worked out how to hack the game! You'll still find a lot of Spanish Spectrum groups floating around.

Russia, however, is a totally different kettle of fish. In Russia, there were no copyright laws; if you wanted something you couldn't get, you could simply copy it. So the Russians decided to embark on mass-production piracy, all perfectly legal, much to the dismay of UK software houses who were kept in the dark about it all the time.

But it didn't just stop at tapes; the Russians went out and built circuit boards of popular computers. The IBM and Macs available in the UK were just far too complex to rebuild, and too expensive to obtain, so they went out and copied a cheaper computer, which just happened to be the Spectrum. As a result, the Spectrum is one of the most popular computers in Russia, and Poland as well (YS quote 'Good old Poland. We're always getting letters from Poland'.) The Polish connection is similar to the Russian one, with the added extra of the Spectrum and Your Sinclair being heavily advertised in a Polish magazine 'Bajtek' (Pronounced 'Bi-Tek', this is possibly THE computer magazine in Poland - with no direct equivalent with any of the UK's games-oriented press.)

As a consequence, there are millions of Spectrum clones in Eastern Europe. The most heard about is a device called 'The Hobbit' (named after one of the best Spectrum adventures of all time, perhaps?), which has the same sort of Spectrum internals, but has a far superior keyboard, VDU and a disk drive interface as standard. I wonder if Russia will sell 'The Hobbit' to the UK like the Glucs?

The lack of Spectrum clones, and of computer games in general in Russia meant that they had to write their own - and they did. The most famous example, of course, is the bestseller TETRIS, but there are plenty of other games around, even remakes of Spectrum classics such as Jet Set Willy.

The South American connection is similar to the Russian one. There are a lot of South American Spectrum users, however, due to the lack of availability of software, there is an enormous amount of piracy. Incomplete and unreliable programs can be bought for the equivalent of 10p in some areas of Brazil. Sadly, most South Americans just can't get original copies of software, so piracy is everywhere. Someone remarked that if you tried to write to British software houses, they just wouldn't send ropes to South America due to the piracy. This simply reduces sales for the software houses, surely.

The South American Spectrum market made its mark with VTA, a Spectrum model recently released on a V's Cover Tape.

So, with the world coming closer together, perhaps we British can get our hands on some of the remarkable achievements of foreign software!



Despite being heavily advertised and promoted through-out the Spectrum & SAM world, the overall response to the planned "mega-event" that was originally to have been held on May 2nd, was not very well responded to by the public. This was mainly due to the location of the venue, date chosen, ticket pricing, and the fact that the promotional material seemed to gear itself more towards people who had made a "landmark" in the Spectrum scene.

But, for the people that did want to meet and talk, the organisers had set up a "mini-event", held at a smaller venue, and it was this which ZAT's intrepid reporter (me!!) visited on May 2nd. Due to the revised and smaller event, several of the noted people originally due to turn up, were not able to. These included Mel Crocker, Sir Clive, and the infamous PkMan (Who

has returned, once more, to his tax-exile in France!).

The informal "get-together" was held in a reasonably sized room in a Cambridge pub (although unfortunately, my financial situation prevented me from sampling the wares at first hand). Present, were Dr Andy Wright, Simon N Goodwin, New Young (FORMAT Writer, and boss of SD Software), Steve Nutting, Glen Cook and several members of the public. Arriving later in the day were Jon Piller and Bruce Gordon.

The day featured a number of interesting items. Spectrum Emulation was featured strongly, with several computers running Spectrum Software. This included:

- a QL running 'Cyberonoid' - although rather slowly (S N G mentioned that with a QL with the 'GoldCard', it ran much the same as a Spectrum)

- an Amstrad 512 PC running 'The Birds and The Bees 2 Antics' (graphics by Matthew 'Manc Miner' Smith, for fact fans), which again was fairly slow, but after all this PC does use a chip which is only about as powerful as a 280, and isn't overly fast! With a 286 driven PC, it would have been much faster!

- an Amiga also made an appearance! It ran both it's own Spectrum Emulator, which wasn't too fast. Additionally, it ran a QL Emulator, running a Spectrum Emulator, which was about the right speed! The "Ultimate" classic, Altic Altic was on show here.

Quest Software

The new name in Spectrum and SAM Adventuring!

For more details, please send an SAE to:

10 Westerkirk Drive, Madeley, Telford, Shrops., TF7 5RJ.

An Amstrad CPC 6128, was also on show, running a simple demo written in Spectrum Basic. The CPC emulator was been written by Andy Wright, and is apparently only 10K slower than the Spectrum. However, it will only allow away with a couple of Zenobi titles, and 1K games, due to lack of memory I ended up with one myself.

and of course SAM was there, running Android 1, and various other classic titles - naturally enough, SAM is much faster at Spectrum emulation than the other machines on display!

One of the other highlights of the day, was the music Simon Goodwin played various pieces of music throughout the day - some of Automata's "wacky" material, some Spectrum created music, and some using the computer's MIDI facilities. Quite a range of material!

Although Sir Clive didn't show up, an Jon Piller rounded off things, with a ex-Sinclair man, responsible for most of the original Spectrum advertising material, did show up. He mentioned several interesting tidbits, such as the fact that originally Interface 1 was going to be built into the Microdrive directly, rather than existing as a separate interface.

Towards the middle of the day, there was a prize draw. Most people who had turned up had donated something. Simon donated a copy of an old DK'Tronics title he'd written Goldmine (on ZX a few months back), Zenobi Software - although not physically there - had donated several

Some of the visiting people had interesting items to show. Paul King, a dedicated Spectrum user, showed some circuits he had designed using a Spectrum PCB designer. Also Paul was showing some great DTP fonts, designed by an Italian user, which I can't wait to buy! Another user showed off his own alternative Spectrum ROM - complete with about RENUMBER command and fancy font! I showed a few people Daniel Cannon's great Tetris styled game - Little 2. This impressed quite a few people!



group photo, which should appear in YS. (The bad news is that I'm in it!) Simon Goodwin also revealed what had happened to Fluor Technology: the ex-Sinclair team, once responsible for 'RAM Print' printer interface, 'RAM Music Machine', 'RAM Turbo' joystick interface, and namely the Konix multi-system (a potentially earth-shattering console, once based around the 280). It seemed that they still exist, but now the wonder-chip that once would have been the heart of a console, now beats inside a 'One-armed bandit'!

All in all, not a bad day. The only thing that spoiled it for me was the ending. When a combination of British Rail and myself, ended up with me being stranded in Leicester until 3am in the morning! What a day!

Although the event ended up being much smaller than originally planned, another event in a much better, bigger, cheaper venue has not been entirely ruled out.

A new SAM!

SAMCo have released details of the latest addition to the SAM family, the new GameStar pack, which is priced at a mere £29.99.

GameStar, is a package which has been designed to promote SAM as an alternative to the consoles currently around, but an alternative that can grow into a more powerful computer system. It consists of a SAM 256k, an improved Spectrum Emulator (from SD Software), 'associative' membership of 'INDUS' (access to the helpline service, for period), some cassette software, and a starter manual.

As upgrading it to a full spec SAM 512 costs only £79.99 for a drive, and £29.99 for memory, it is a valid way

for Spectrum upgraders with low incomes, to afford to buy a SAM.

To coincide with this new model, a range of cassette software has been planned by Format Publications. These will include Spectrum titles - used via the emulator, and SAM titles.

Contact SAMCo on 0792 700000 for more details.

New music package!

After the long wait for a SAM Music package was ended by The Sound Machine, Revelation are due to release a second music package shortly. The package, ETracker, has been written by 'ace' Czech programming team, ESI.

ETracker boasts full control over the Sound chip, and as ESI boast on their 'Out of Colour' demo, it is the 'best music program on SAM Coupe, and the best on any 8 bit computer'. After using a pre-production version for a few weeks, I can't argue with that!

ESI are also responsible for a well-known music package, Sound Tracker, on the Spectrum. Perhaps SAMCo may release this one as well? Contact SAMCo for more info.

Belgames allowed!

Astroball, SAMCo's first Spectrum release, seems to have done pretty well in a recent YS, after gaining 90% The SAM version is also now ready.

Revelation have also got another Spectrum title by the same programmer in the offering, Astroball 2: Turbulence, has been described as being rather an 'odd' title - but a good game never-the-less! Astroball will be reviewed soon.

It's nearly ready!

Yes, after a long delay, SAM Quartet 2

is almost ready! Anyone who has paid for a copy will get theirs before the end of June. If you don't get yours by then, drop me a line via Quest.

Featured on 302 is another great game by Daniel Cantoni, an example of Guy Middleton's Terminator 2 demo (which thanks to a great compression program from Daniel, has been cut from over 250k, to just over 100k!), a selection of digitized graphics, some music from the great new Music package Elsevier, and some Archimedes graphics - converted to SAM by Daniel.

Printing problems...

Unfortunately it seems ZAT's printer, has been forced to increase his printing rate. However, due to our forced price increase a while ago, we have managed to swallow this increase with only one casualty - we are now forced to stick to 32 pages, except for the occasional special issue.

To counteract this, we intend to pass material to Andy Davis's tapestore Aitch-News that may not have fitted into ZAT. Likewise, SAM specific items will be passed to SAM Questal.

This shouldn't effect ZAT's content to any major degree, and further subscriptions will enable us to return to 36 pages. A good incentive to get your friends to subscribe, don't you agree?

Quest ... ready now!

At the time of writing Quest Software, David's new Adventure label, is only weeks from releasing it's first Spectrum title. The game, Domesday, was written by Enceladus genre - Graham Burleshaw - and is best described as being rather 'controversial' to say the least.

Quest are also responsible for 2 new compilation disks, featuring games from the 'Delbert The Hamster Software'

label, responsible for Microair Madness - which was recently given an excellent review in Your Sinclair.

The disks, 'Delbert's -D Disk Delights' volumes 1 & 2, feature:

volume 1: Desmond & Gertrude, Aunt Volma's Coming to Tea, Brian and The Dishonest Politician, and Andy Davis's Aitch-News 1.

volume 2: Star Flares, Raymond Pringle's Quest For The Fabled Jar Of Pickled Cabbage, and Microair Madness (40 & 128 versions).

For more details of these, and other titles, a nice SAE should be sent to the address on the Quest advert. All Quest Spectrum titles will appear on -D disk, and cassette. Cassette versions are provided by DTHS. SAM versions will appear at a later date.

The return of the P1Man?

Rumours have been abound, that the most infamous character in Spectrum adventuring history - the nefarious P1Man - is planning to make a return to the screens of the Spectrum, and has first appearance on SAM!

The big-nosed one has recently been seen making an appearance on the Amiga, in the title 'Airmons', but apparently he has made plans to appear on more familiar territory at some time during this year. More details as we get them!

Send in the SAS!

Colin Jordan's SAM Adventure System, designed to aid Adventure programmers with Adventure creation, is due for release on June 1st.

The system is packed with features, and is operated via a 'window' styled method, which makes programming much easier. More details, and a review or preview, next issue.



Hello there, welcome to another dose of hacks, cracks and POKES for you all to enjoy. Before I start, I hope to have some POKES for the SAM written soon, so I'll print them as soon as I get access to a SAM.

HOW TO USE POKES:

POKES are simple cheat routines which consist of a few lines of BASIC. When RUN, they load the game and activate whatever cheats are present.

Simply type in the listing exactly as it is printed in particular, pay attention to the numbers in the DATA lines, because they're easy to get wrong. You must make sure you've typed in exactly what's printed, otherwise the POKES won't work!

When you've typed out the POKES, it's a good idea to save it to a blank tape, so you can simply reload it when you want to cheat.

With your POKES in memory, you type RUN and press ENTER. Insert your game tape from the start and press PLAY on the cassette recorder. Wait until the game loads, then cheat away!

Some POKES do a variety of things. In this case, the REM statement after each line refers to what that cheat does and will activate. If you don't want that cheat, don't type out that line. At the end of the listing, there will be a line called END MARKER. You MUST type this in, regardless of what cheat's you're using, otherwise the POKES won't work!

DEATHCHASE - infinite lives and immunity

10 REM DEATHCHASE BY RICH

```
20 FOR N=12584 TO 319
30 IF A=999 THEN READ A:POKE
N:A:NEXT N
40 RANDOMIZE USR 32584:GOTO 40
50 DATA 221,23,0,64,17,72,83,82
60 DATA 255,54,215,86,5
70 DATA 175,50,95,103,REM LIVES
80 DATA 62,200,50,255,102,REM
IMMUNITY
90 DATA 201,999,REM END MARKER
```

3D LUNATACK - infinite lives

```
2 MERGE "3POKE" (PEEK
21677)+256*(PEEK 21638)+31,201:GOTO
20
300 POKE 5,0:29,0:POKE (PEEK
21627)+256*(PEEK 21638)+31,205:
RANDOMIZE USR (PEEK
21627+256*(PEEK 21638)+31
```

CHASE HQ (Budget release) - infinite credits and turbos

```
10 REM CHASE HQ BY RICH
20 LOAD "CODE"
30 POKE 42562,275
40 FOR N=9280 TO 319
50 IF A=999 THEN POKE N:A:NEXT N
60 RANDOMIZE USR 42496
70 DATA 85,14,255,17,0,64,1,30
80 DATA 0,217,176,195,0,64,82
90 DATA 195,0,44,91,25,14,84
100 DATA 34,44,91,195,0,90,33
110 DATA 229,221,34,44,91
120 DATA 62,162,50,82,156,REM
CREDITS
130 DATA 175,50,145,176,REM TURBOS
140 DATA 201,999,REM END MARKER
```

BMX SIMULATOR II - infinite time. The POKES will automatically detect whether you are loading side A or side B, and alter the POKES accordingly.

```
10 REM BMX 2 BOTH SIDES BY RICH
20 CLEAR 24316
30 FOR N=21584 TO 21628
40 READ A:POKE N:A:NEXT N
50 RANDOMIZE USR 23296
60 DATA 221,31,0,95,17,0,1
70 DATA 62,255,95,205,86,5
80 DATA 48,241,71,21,91,14
90 DATA 119,95,195,0,96,33
100 DATA 33,0,201,74,91,125
110 DATA 195,0,96
```

TRAILBLAZER - infinite time and jumps

Original version

```

10 REM TRAILBLAZER GREMLIN BY RICH
20 LOAD " CODE
30 POKE 6002,7,43
40 POKE 60020,2,25
50 FOR N=40200 TO 129
60 READ A,P A=>999 THEN POKE
N,A,EXT N
70 RANDOMIZE USR 60000
80 DATA 175,50,83,136, REM TIME
90 DATA 175,50,242,136, REM JUMPS
100 DATA 195,8,132,399, REM END
MARKER

```

Budget Rerelease

```

10 REM TRAILBLAZER MASTERBROMIC
BY RICH
20 FOR N=23296 TO 129
30 READ A,P A=>999 THEN POKE
N,A,EXT N
40 RANDOMIZE USR 23296
50 DATA 221,33,203,92,17
60 DATA 163,0,62,255,53,205
70 DATA 95,5,46,241,33,24,91
80 DATA 34,254,82,195,222,92
90 DATA 175,50,83,136, REM TIME
100 DATA 175,50,242,136, REM JUMPS
110 DATA 195,8,132,399, REM END
MARKER

```

BUGGY BOY (Budget re-release) - Infinite time

```

10 REM BUGGY BOY BY RICH
20 LOAD " CODE, POKE 63537,255
30 FOR N=63260 TO 63501
40 READ A,P,POKE N,A,EXT N
50 RANDOMIZE USR 63468
60 DATA 82,24,50,221,33
70 DATA 195,0,126,64,85
80 DATA 82,66,79,32,63,85
90 DATA 87,75,83,33,30,30

```

SPACE 7 - Infinite lives

```

10 REM SPACE 7 BY RICH
20 CLEAR 245144,0AD " CODE
30 POKE 65226,0,POKE 65277,91
40 FOR N=23296 TO 23303
50 READ A,P,POKE N,A,EXT N
60 RANDOMIZE USR 65158
70 DATA 33,9,91,34,252,97
80 DATA 195,164,87,33,160
90 DATA 196,34,177,196
100 DATA 195,0,235

```

TECHNICIAN TED - Megahack

[WARNING: Don't try and walk to places which you normally can't get to, otherwise strange things happen.]

```

10 REM CHIP FACTORY BY RICH
20 FOR N=23296 TO 129

```

```

30 READ A,P A=>999 THEN POKE
N,A,EXT N
40 RANDOMIZE USR 23296
50 DATA 221,33,203,92,17,224
60 DATA 282,255,53,205,86,5
70 DATA 48,241,62,195,50,146
80 DATA 95,33,24,33,34,147,95
90 DATA 195,21,35,62,201,50
100 DATA 146,95,33,33,0,34,147
110 DATA 95,62,195,50,195,175
120 DATA 33,35,64,34,196,171,33
130 DATA 107,5,208,82,195,50,90
140 DATA 140,33,72,81,34,80,140
150 DATA 33,196,77,195,67,140
160 DATA 33,24,91,34,176,172, REM
LIVES
170 DATA 175,50,114,171, REM TIME
180 DATA 62,10,50,117,186, REM
IMMUNITY
190 DATA 175,50,95,186, REM WALK
THRU WALLS
200 DATA 195,101,170,399, REM END
MARKER

```

SPLIT PERSONALITIES - Infinite lives

```

10 REM SPLIT PERSONALITIES BY RICH
20 FOR N=65408 TO 65451
30 READ A,P,POKE N,A,EXT N
40 RANDOMIZE USR 65408
50 DATA 243,49,255,255,221,33
60 DATA 25,186,17,273,2,62,255
70 DATA 55,205,86,5,48,241,205
80 DATA 126,82,221,33,0,64,17
90 DATA 126,191,62,199,75,205
100 DATA 147,161,33,63,2,34
110 DATA 125,212,195,370,209

```

TOOBIN' - Infinite credits

```

10 REM TOOBIN' BY RICH
20 FOR N=24480 TO 24512
30 READ A,P,POKE N,A,EXT N
40 RANDOMIZE USR 24480
50 DATA 221,33,203,92,17
60 DATA 156,167,755,58,205
70 DATA 86,5,46,241,33,194
80 DATA 85,38,43,84,195,217
90 DATA 93,33,0,0,34,24
100 DATA 241,195,0,120

```

END

Sadly, that's all I've got time to write for this issue. Don't despair, because there'll be more hacks and cracks next time.

Meanwhile, why not write some POKEs yourself, and I'll do my very best to print them.

Compiled by David Ledbury

Another issue is upon us once again, and with it brings yet another journey into the technical world with Chipshop. Due to this issue's features, we are only mainly concentrating on the next section of Daniel Cannon's Machine Code Tutorial series, although all the usual favourites will be back next time.

Don't forget, if you've missed any issues, then we can supply copies of back issues for a reasonable fee! Just write to the usual address for more details.

However, for those of you still working in BASIC - whether it be BetaBASIC on the Spectrum (Available from BetaSoft - address hopefully somewhere in this issue) or in SAM BASIC - we are currently hoping to get permission to use program listings from Doctor Andy Wright's BetaBASIC Newsletters, which should be quite interesting! More about this when we've got it all finished!

But for now, it's back to Daniel ...

CODE BREAKER by Daniel Cannon

Reading the keyboard. First a few explanations (as always). 50 times a second, the ULA (or ASIC for SAM) made your computer talk the processor to interrupt. At this point, whatever the processor is doing, a RST 56 is done. At address 56 is a routine which talks the computer to read the keyboard, update the timer (a system variable at addresses 23672 to 23674), and (if you have a SAM) a few other things. At

the end of the interrupt routine there is a RET instruction which returns back to the program interrupted, as if nothing happened. The upshot of all this is that we can be sure that the computer will store the result of any keyscan if it takes the trouble to read the keyboard 50 times a second.

In the next few programs which detect keypresses you must quit the program by holding down Enter (or Return) to display the "Scroll?" message, then press N. The computer will report an error to say that you didn't want to scroll, and then return back to BASIC. Can you find a better way, say by pressing a certain key, to quit??? Try the CP instruction.

First the Spectrum. At address 23611 is a system variable called FLAGS. Bit 5 is used to check if a key has been pressed (bit 5 set) or not (bit 5 unset). Unfortunately, other bits in the same system variable are used to store other information, so you have to find a way of reading this bit whilst ignoring other bits. This is where the BIT command comes in. First we point HL to the address with the bit we want to read, and use BIT 5[HL]. The processor will check bit 5 of the address pointed to by HL, and return either Z (reset) or NZ (set). We can then act on this information. You can check all the BITS (from 0 to 7) and most registers (A, B, C, D, E, H, L) as well as (HL).

If the answer is zero (reset) then there has been no key press, so we must wait for a keypress by jumping back. If there has been a keypress then we read it's code at address 23560.



Next we must say that we have read our keyboard, and now we want the computer to take notice of the next keypress. This is done by resetting bit 5, to say that now there is no keypress (It sounds strange, but try omitting this instruction to see what happens). RES stands for reset and it resets a bit, it can use the same registers as the BIT command. SET also understands the same registers, and you can have a guess as to what this one does.

Try program 1 to see this in action:

```
010 /PROGRAM 1: Spectrum keyboard
    read.
020 /Start 32768, end 32767, length
    26.
030      ORG 32768
040 /Use main screen (see part 4).
050      LD A,2
060      CALL 5633
070 /Point HL to FLAG5
080      LD HL,23801
090 /Check bit 5. If zero, then jump
    back. This looks like
100 it would loop forever but
    remember that the interrupts
110 are being used whilst this
    program is running.
120 loop=BIT 5,(HL)
130      JR Z,loop
140 /Get the ASCII code of the key
    pressed into A.
150      LD A,(23560)
160 /Say "key not pressed" any more.
170      RES 5,(HL)
180 /Print the character.
190      RST 16
200 /Loop back.
210      JR loop
```

Now the SAM, which is a far easier beast to work with. If you have a version 3 technical manual then you can see the routines I'm using on page 41. If you haven't then get one!

To read a key you should use CALL 2669. The sub routine returns with the

zero flag set to 2 if no key was pressed, or NZ and the code of the key pressed in the A register. Look at program 2 for an example of how to use this, and compare it to program 1.

```
010 /PROGRAM 2: SAM keyboard read
    using CALL 2669.
020 /Start 32768, end 32769, length
    13.
030      ORG 32768
040 /Use main screen.
050      LD A,2
060      CALL 26112
070 /Scan the keyboard. If Z, no key
    pressed, so jump back.
080 loop=CALL 2669
090      JR Z,loop
100 /If NZ then the ASCII code of the
    key pressed is in A.
110 /Print the character.
120      RST 16
130 /Loop back.
140      JR loop
```

Or, you can get the computer to wait for a keypress, by using CALL 266C. When a key has been pressed the sub routine returns with the code in the A register (so you don't have to worry about checking if a key is pressed or not). See program 3, and compare it to 2 and 1. Here the computer takes care of the delay and keyboard repeat automatically.

```
010 /PROGRAM 3: SAM keyboard read
    using CALL 266C.
020 /Start 32768, end 32769, length
    13.
030      ORG 32768
040 /Use main screen.
050      LD A,2
060      CALL 26112
070 /Scan the keyboard, waiting for a
    keypress if needed.
080 loop=CALL 266C
090      JR Z,loop
100 /The ASCII code of the key
    pressed is in A. Print it.
110      RST 16
120 /Loop back.
```



130 JR loop

Or (!), you can use the Spectrum method. This has the advantage of using the keyboard buffer (which you don't find on a Spectrum). As an example, load up something like SC_Asembler, return to BASIC, and edit one of the really long lines. Press the up cursor to move to the end of the line, then type something really fast, and take your hands off the keyboard. You can see that the computer catches up with you. This is keyboard buffering. The computer stores up the keypresses and waits for your program to read them out as soon as possible, useful if your program is hasty slow (like the SAM editor when it has half a screen to handle). Try program 4 to see this in action. If you want to clear the buffer use CALL 2966 in your program.

```

030 PROGRAM 4, SAM keyboard read
    using Spectrum method.
040 Start 32768, and 32767, length
    20.
050 ORG 32768
060 Use main screen.
070 LD A,2
080 CALL 20112
090 Point HL to FLAG.
100 LD HL,23811
110 Check bit 5. If zero, then jump
    back. Remember that
120 interrupts are running.
130 loop=BIT 5,(HL)
140 JR 2loop
150 Get the ASCII code of the key
    pressed into A.
160 LD A,(23560)
170 Say "key not pressed" any more.
180 RES 5,(HL)
190 Print the character
200 RST 16
210 loop back
220 JR loop

```

Fine, but this is just like the INKEY\$ instruction. What machine code games are famed for is their ability to read more than one key at once. First we are going to return back to ports. We've seen the border, sound, and tape ports. Now we want to read the keyboard, which is done by reading (you guessed it) the keyboard port.

KEYBOARD port 254, Controls keyboard and tape input.

0-4: Keyboard block
5 : Unused on Spectrum, light pen input on SAM.
6 : Tape input (ear).
7 : Unused on Spectrum, screen off indicator on SAM (not MMIO as described in the technical manual on page 21).

Port 254 is used here (again). Although we are using the same port number as the border and sound, the difference is that we are reading, not writing. Why wasn't the keyboard given it's own port number to make things nice and clear? It usually takes a different circuit to check for each port number, so if you cut down on the circuits you cut down the price, and simplify things.

How do you cram the entire keyboard (40 keys on the Spectrum and 72 on SAM) into just the 5 bits the port allows us to use. The answer is you don't. You split the keyboard into groups of five keys (called blocks), which just leaves us the problem of telling the computer which block we want to use.

Here the BC register comes in handy. The C register is loaded with the keyboard port number (254), and the B register holds the block number. Each



block is given it's own bit, so we are allowed 8 blocks (8 bits).

Block number	4	3	2	1	0
E11111110	V	C	X	1	0
E11111100	G	F	D	5	A
E11111001	T	R	E	W	Q
E11110101	S	4	3	2	1
E11101101	6	7	8	9	0
E11011101	Y	U	I	O	P
E10111101	H	J	K	L	ENTR
201111101	B	N	M	SYM	SPC

You may be able to see some kind of pattern. If you read the description in the Spectrum manual (chapter on IN and OUT), it doesn't make a lot of sense for anybody who doesn't have a 48K rubber key Spectrum, and SAM owners don't get any description, which is why I typed the whole lot out (at great expense).

And any Spectrum owner who has a - or above will probably be puzzled at the lack of the special control keys which are on the left hand side. The answer is there are none! They are simply a combination of SHIFT and a number key, which is why many games with redefine keys treat them as one or the other. But SAM control keys are not combinations of SHIFT and number keys.

Meanwhile SAM owners are missing another 32 keys! The keys I've just described are the main keys you need - the other keys are accessed in a slightly different way which I won't go into here (because space is limited).

To tell the computer which block we need to read we must use port numbers which are greater than 255. This means that the simple OUT (port)A or IN A(port) will not work.

with single byte port numbers. Instead the IN (C)A command is used. This reads the port which is currently in the BC register (although it looks like just the C register from the way the command is worded, but not to worry).

It is at this point I have to explain how register pairs work. You know

that you can join two 8 bit registers together to allow you to form 16 bit numbers. So clearly one of the paired registers takes the part of bits 0 to 7, and the other of the paired registers takes the part of bits 8 to 15. Which one takes which part though? The processor decides that for us - the first register in the pair (eg B in the BC register) takes the part of the 'high' bits, and the last register in the pair (C in this case) takes the part of the 'low' bits. This means that the value in the B register is shifted up the 16 bit number by 8 bits. If we want to shift bits around the byte we can multiply and divide. So to shift up by 8 bits we multiply by $2 + 8 = 256$, and to shift down we divide by 256. So if you did a LD B1 : LD C4 and found out the value in the BC register it would be $1 + 256 * 4 = 260$. If you did LD BC,54321 then you would have 54321 divided by 256 which is 212, and the remainder in the C register which is 49. I hope it makes sense. I'm sorry, but that is the clearest way I can think of to explain about how register pairs store numbers (which is why I put it off in the first place!).

Anyway, the computer will expect the keyboard port number in the low



register and the block number in the high register. This can be done with LD C,254 and LD B,block number. Once the registers are set up we can use IN A,C to read the port. The keyboard is read in the A register. Ignore bits 5 to 7 (these aren't important) and concentrate on bits 0 to 4.

These bits are set if the key isn't pressed, and reset if they are pressed, the reverse of what you may expect. You can then test them with the BIT command to check for a specific key and act on the result. See program 5.

010 *PROGRAM 5. Keyboard read using keyboard port. This*
020 *waits until keys B, Y, and E are*
030 *held down together.*

```
030 Start 32768, end 32794, length
27
040 ORG 32768
050 ;C holds keyboard port number.
060 LD C,254
070 ;B holds the number of the block
with key B in.
080 loopLD B,00111111
090 Read that block into the A
register.
100 IN A,C
110 ;f BIT 4 of A is SET then B is
not pressed, so loop
120 until it is.
130 BIT 4,A
140 JR NZ,loop
150 ;Now do the same with the Y key.
```

```
160 LD B,11001111
170 IN A,C
180 BIT 4,A
190 JR NZ,loop
200 ;Now the same with the E key.
210 LD B,11111101
220 IN A,C
230 BIT 2,A
240 JR NZ,loop
250 ;f the program has got to here
then B, Y, and E must
260 be held down. So return.
270 RET
```

You can read more than one block at once. Say you wish to use the entire 'bottom row' (CAPS, Z, X, C, V, B, N, M, SYMBOL, SPACE). You can do this by using LD B,XHINH. Both blocks are read, and the keyboard bits are merged together. So, if you got an answer of XHND, it could be SPACE or CAPS (look on the rightmost column and the two rows of XHINH and XHND).

You can read the entire keyboard by LD B,1. One main use for this is to wait for any key to be pressed. See program 6. Here we use the AND instruction which filters out unwanted bits, and the CPL instruction which 'flips' the bits (sets all reset bits and resets all set bits). It's not really important how this routine works (yet) but just remember it all the same.

010 *PROGRAM 6. Wait for any key to*
020 *be pressed.*

```
020 Start 32768, end 32779, length
12
030 ORG 32768
040 LD C,254
050 ;All keyboard.
060 LD B,0
070 Read key into A.
080 loopIN A,C
090 ;Set all reset bits and reset all
set bits.
100 CPL
110 ;Ignore bits 5 to 7. If no key
pressed then all of bits
120 ;0 to 4 will be reset.
130 AND 00011111
140 JR Z,loop
150 RET
160 ;Remember that you are going to
have to tap the ENTER
170 Key very lightly after the CALL
command for this to
180 work, otherwise it will return
straight away.
```

Now there is a problem. In this case it is to do with the design of the



computer, and there is nothing you can do about it. The keys pressed in one block may affect the result from the keys of another block, which can be a problem with many two player games. Have a look at program 7.

```
10 REM PROGRAM 7: see the effect
of keypresses on ports.
20 PRINT AT 0,0: FOR a=0 TO 7: LET
port=(254+257*(255-2+a)): PRINT port,
TAB 5: IN port: NEXT a: GO TO 20
```

See if you can write a program to detect Q, A, O, P, and M or SPACE as fire, and poke addresses in the memory which can be read by a BASIC program, so you can have a BASIC game which reads these addresses and allows you to detect more than one key at once. I'll give possible solutions to this and the quit key problem next time. Bye.

Once again, I'll just remind you about the fact that the "bash" sign always comes out of our DTP as a & sign - so watch out for this little quirk when typing in listings!

Right, I'll now hand you over to the capable hands of Steven Kemp, with another:

Program Box:

Steven Kemp

Serious Readings:
System Variables 8

This issue, there's a short piece about the "MODE" System Variable for you to read about!

MODE 23617

This variable tells the computer which cursor to print, although it must be poked from within a program, or before an INPUT statement to have any effect, as it is reset while in BASIC's editor.

Most of the acceptable values can't be used, as they cause undesirable effects, eg poking with a number between 4 and 129 will lock you in Graphics mode.

The following program shows the general use:

```
10 FOR f=1 TO 4: READ a
20 POKE 23617,a
30 INPUT "Type something in : "LINE
a$
40 NEXT f
50 DATA 252,222,158,164
```

Of course some experimentation is necessary to choose your own values. Just poke in all the numbers from 130-255 in a loop, inputting as you go.

Thank you Steven. Next issue, we'll have a very useful program from Steven, to help you investigate the contents of the 280 registers.

What I would like to hear from all Spectrum owning readers, is details of any drive systems owned. Why? Well, there is a good possibility that we may be releasing some listings that we have printed in the past for the Spectrum - and some we have not used yet - on a Spectrum compilation disk. So, yet me know via ZAT, and we'll see if it's worth it.

Until next time, DL

Mean biz

DARREN BLACKBURN
ANDY DAVIS and CO

Spectrum Hacking and Tape loading
(C)1992 Andy Davis. Permission to cut
and paste from any article granted.

Before I begin, neither I or this magazine promotes hacking for financial gain and pirate copies. It is both immoral and illegal and these kind of hackers give programmers a bad name, cause software prices and indirectly kill support for a particular machine. The quest of fearless hacking is only to gain knowledge of how programs are made and how to disassemble the authors method of manufacture. The old adage: "Theft's never proper" could also advise hacking. I must admit that the feeling you get when you make a POKE or track a seemingly unremarkable loader is nothing short of ecstatic, but in the long run it puts you off the game forever. It's not worth playing a long adventure if you've released it before, is it?

In this article, I'm not going to do a Kon North and start a series featured in Y's. I wish incredibly got too difficult and boring for new users, but if you're reading Kon, it was a first class series and the sorry I'll cut it. You could always get a job with ZAT or Airnewave. Instead, I'll give a quick rundown of bits of the trade and move onto a landmark of Sinclair computing. The Spectrum Loading System.

Modern hackers start out by buying a multiface, which gives you total access to every byte of RAM, whether you have 4K or 128. Multifaces also come with an extra 8K of RAM which allows extra hacking software to be installed. There are 10164ARD. An infinite lives printer and MEME. A disassembler. Any game with a multiface usually makes no use of the extra 8K memory which is sadly wasted as it makes your computer either 50K or 128K. Look out in future issues for an article called "More than your Multiface" which can also be found in Airnewave.

are a DEASSEMBLER, a program which in effect "disassembles" the code into 286 machine language, text or pictures, so you can find text or the line which determines how many lives you start with. Sadly, the more features a disassembler holds, the more memory it takes, and seeing as now a days new games take up every scrap of RAM, you won't lose some programs. The trick is to first load the disassembler into the lower half of RAM, say 30000 and disassemble 40000 to the end, then reload the game and put the assembler at 50000 and disassemble 30000 to 40000. A little messy I agree, but it's the only way. If it all goes well saying "load the game" and then "load a disassembler" but the biggest problem is how to break into a program. Multiface owners can use their F&T function or 4K owners can get a piece of code which is installed into the printer buffer (23296-23551) which allows a new BREAK key to be defined.

Another problem is that new games take up all the available memory, using from 23552 to 32768 which should be unused to allow you to return to BASIC. So if this is occupied, the computer will still crash there is one way to get into basic and get some little memory. The way is to alter a system variable to make the spectrum perform a NEW command when quarkies exit to BASIC, but if you haven't CLEARED your code, (protected it from accidental NRUc), then all is lost. So, first you must find a way to POKE 23296,128 and 23297, 97. Then you must alter the program counter (PC) to 4595 or 1867 Hex. Now, the computer will reset to basic leaving all code from 25000 intact, losing only just over 8K. Depending on support for a section like this, I may continue, giving more support for new players ask them! Write to me, or the editor now and say what you think!

Spectrum Tape Loading System

The flagship of loading systems on all 8 bit machines must be the Spectrum system. The way it allows you to leave the format and the bars which appear on screen when loading tell you an encyclopaedia full of information!

Other programs which come in useful Standard Loaders

This is usually the "Whereee- Bip (Peeee) Whereee- chugga chugga etc!" This is the system the basic load and save uses. In fact, when you type save or load, you are not loading in the program but two!

The short "Whereee- Bip" is a 17 byte program header which tells the spectrum what to expect next- how long the next piece of data is, where it has to go, what type it is, how long it is and finally a file name. These are simple to crack and you can pick up a tape header reader from anywhere to find what you are loading in.

Headerless loader

This is the same as above, but doesn't feature the "Whereee- Bip" part. This system is a little more complex as it won't load in by a standard Basic LOAD command. It needs all the information set up before hand. It also doesn't have a filename which makes finding a particular part difficult!

Here is a piece of machine code which would load in a screen picture without a header. You can try this by finding a screen picture from a game by typing LOAD and loading in the first part. Then when it does the "Whereee- Bip" for the screen, stop the tape AFTER the "Where- Bip" which shows the filename. Now reset the computer and type or POKE this into address

400000.

ASSEMBLER	HEX	DECIMAL
ORG 40000		
DE	F3	243
LD 0,16384	D0 21 00 40	771 013 000 064
LD DE,06912	11 00 18	017 000 6/7
XOR A	AF	175
SCF	77	055
CALL 1366	CD 56 05	205 066 005
HL	F8	251
RET	C9	201

Now, RAND USR 40000 and play the tape. The code should miraculously be executed and load the screen. Quite a few games use this method to stop standard loaders from being put through a header reader and being copied. But the way you can find where it's going in to look in the

basic loader. You will usually find a few data statements POKEing numbers into addresses or a short standard piece of code before all the headerless code. Discoverable the address to where this data is going (usually the RAM) address-1 and note down the times LD IX is used and the address and the same with LD DE. LD IX is used to store the start address of where to put the code and LD DE is used for the length. SCF means load in the code and not saving it. LD A,FF or LD A,255 or XOR A means that the headerless file is code and not basic and CALL 0556 Hex or CALL 1366 means call the piece of code in ROM to load it all in.

Some games may have this "program" in twice- Once to load in the screen and once for the code. To check, the screen will be LD IX,16384 and LD DE,6912. Some authors cheat and load the screen to high memory (like 40000) and then move it down to 16384 later. You'll usually know when you have a screen because DE is usually set to 6912. After all the LDs and CALLs, you'll get a JP address. This is like a RAND USR, and starts the game off. If you alter the CALL to a RET (CD 10 C9 or 205 to 201) it will return to basic! Then you can perform the RAND USR sooner after maybe looking around with a disassembler or putting pokes in.

Turboload

These are the same as above but go

faster. The code to load them in isn't in ROM, so has to be in RAM usually high up. The principle is the same as above though, a piece of code with a header is loaded in and RAND USR'd. IX and DE are still used, but instead of CALL 0556 or CALL 1366, it's usually much higher to the same piece of code in ROM but with some variables altered to read in the data much faster. If you've

disassembled the spectrum loading routines at 1366 decimal, you can compare them with the turbo code higher up in RAM.

Firstaid Loader

In my op. ion, the most reliable loader-

ever written for HAM.

The whole operation is to load in a short piece of code and repeat the process many times. It also includes a test, so if it didn't load as properly, it tells you to reload and do it again. Even though the little blocks are headerless, they are clearly numbered. The only sad part about this is that it takes absolutely ages to get a game loaded up.

Well, there about all the different loaders around today. Bleeploads and Speedload loaders are just variants of turboloads. There is a crash-load around which I created in 1990 which is like a turbo loader, but the opposite which loads data in really slowly, rather than fast! It's so slow it would take about 45 minutes to load in a 1/2 file game, so measure a 1/2 file SAM game? 2 hours 20 minutes! Yeah, it's no wonder people turn to disk drives.

To uninstall, just, or sooner if you want to drop me a line, but

Aliveness is available FREE so long as you supply a blank 190 and 1A6. Please include an SAE for a query. The address is ALCHMNT H1240R16 62 14th Ave. East, Woodhouse, Thetford LE13 7LN

Thank you for that interesting and useful article Andy.

Now it's time to get over to Daniel Cannon, for a review of the long-awaited SAM music making program The Sound Machine.

How many times have you tried to write your own music for your SAM (except after listening to something like a Masters of Magic music demo)? How many times have you failed? Probably your answer will be the same as mine - every time. So as soon as it was released ordered a copy of The Sound Machine from SAMDO. Three months later and I finally received it - which is why this review is slightly late. Never mind though. The package includes a program disc, a blank disc to save your music on (none too big), and 70 pages of OIP produced instruction book.

The manual goes through how to use this program right from the beginning in great detail. First it explains how to load up the demo tunes, and how to modify them. Next you enter your

own tune then it gives you the start of a well known tune and you have to finish it off. Finally it tells you how to read sheet music. It's well written and it explains all the things you'll need to know.

Upon loading you are presented with a picture of SAM being extremely funky with a guitar-synth and an icon bar across the top. Using either mouse or QWERTY keys to click on the bar will give you 3 options - the music editor, the waveform generator, or reset the computer.

Because I have no mouse I had to resort to keyboard. As you have probably guessed, holding down right, for instance, will move the pointer to the right. On Flash the pointer will gradually increase in speed as you hold the key down, so it is a fairly quick process to move from one side of the screen to the other. With SAM things are different - the pointer merely flicks the screen at a fixed rate, which can be slightly irritating. However it's a fairly modest kind of pointer - you might not find this a problem.

Anyway, clicking on the note icon will load the music editor. First you will be presented with a few disc drive commands (load, save, dr, etc.). Clicking on the icon bar again will put you into the music editor proper. You'll see a large proportion of the screen fill up with a grid. The y axis of the grid is used to measure the pitch of the notes, and the x axis is used to measure time. To the left of the grid is a keyboard which you can look up your notes on so that you know which y coordinate in the grid produces which note. Below the grid is a cluster of icons. Below that is a full 7 octave keyboard. 'Lights' appear on the keys as songs are being played to show you which notes are being used, a la Master Mixer (open version) or Finality.

Using the grid you click on where you would like a note to appear and it appears. The height of the note on the grid determines it's pitch. As the whole range of octaves won't fit onto the screen at once, you can scroll the grid up and down by clicking the octave change icons. The x position determines how far into the tune the note will be played. You can scroll the grid left and right as the length

of your song increases. You can also ask for divisions to be played along the grid at regular intervals which represent 3 time (waltz type music) or 4 time bars so that you don't loose your place. It's all nice and easy to use (if complicated to explain), but a little slow if you are in a hurry.

Each note can be played using one of 30 waveforms (instruments), and all 6 channels can be used at the same time. One problem is that you cannot play two notes straight after each other which are of the same pitch in the same channel. So if you wanted Da Da Da Bass, you would end up with Daaaaaa. This problem can only be solved by switching channels between each note played which is a bit of a pain.

You can copy blocks of notes around the tune, store patterns of notes which can be repeated later at different pitches (called macros), play sections of the song using something akin to the controls you would find on a tape deck, and test your creation by muting out channels to see if one channel has the best wrong for instance.

The waveform editor allows you to create the different types of sounds you want in your tunes. For example, you may want a piano and a drum in your tune. By altering the amplitude (volume) and frequency (pitch) of each note played slightly you can do this. To make a piano like sound you would set the amplitude to start off loud and die down slowly. You could change the pitch slightly as the note finishes. A drum sound would start off louder than the piano and die down quickly, and it would use white noise (a sound like an untuned radio) at a low pitch.

The big but about the waveform editor is the length of the waveforms: you are allowed to create Waves can only last for around half a second - no more. This tends to run any chances of things like snare drums and guitars which last longer than that. The other prob is that you are only allowed 10 waves per tune - not a lot if you think about it!

Full instructions are given so that you can use the music in BASIC or Machine Code. Special provisions are

given in case you want to play your own sound effects whilst the music is playing - you can mute out channels and replace them with your own in game sound effects. Each tune requires 4 pages of RAM however, which can put a crimp on your machine code programming if you want to fit it in a 256K computer. However I've heard that there's a song compressor out on PD already.

In reviewing this program, I think that I have to make comparisons between this and Soundtracker (for the Amiga or Archimedes), because basically, it's a Soundtracker hat. Soundtracker is a similar program for these computers which doesn't look as pretty and isn't as user friendly (not by a long way). However, it has a method of entering notes which is fairly fast (you type the notes in on the keyboard), and it allows waveforms which can last up to 10 seconds or more.

I don't know what to make of this. Yes it is a very good program, yes you will have fun using it, yes it is very useful. But maybe I am too used to Soundtracker (and too biased?) - I find the process of entering notes a bit slow (I would prefer to type them out on the keyboard) and I think the limitation on the length of the waveforms is too much to make them really useful. However this is still a good program which you will like. To say buy it, despite these little quarks.

Refined

Unfulfilled 90
Presentation 90
Compatibility SAM
Overall 80

Note: We've just heard that there may be ANOTHER music package available soon for SAM. No details yet, except that it sounds (great?) as though it should be something special!

That's it for this Edition. Next time, we hope to have a "game" at Star Atlas, KP-Disk, and maybe a look at one of the 2 new Arcade Development packages for SAM. Additionally, we may take a look at Microsoft BASIC - the excellent computer for the Spectrum. Until then

SPLIT SCREENS

by DAVID ADDEY

Heavy Split Screens return! After the success (I hope) of the first one I'm back for another and this time I'm dealing with 3D isometric games. What? I hear you say. Don't you ever listen? 3D isometric games of course. Still confused? Let's take a look in the directory.

SOME 3D GAMES (I suppose *isometric* is *isometric*)

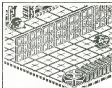
Hard to describe really. They sort of look as though they are 3D in perspective, but they aren't. You usually have to control a "cute" character of some form who moves around in a "cute" sort of way.

It's best explained by a few examples. *Hogus Troops* is popular. *Kubrick*, *Down Ship* character from *2000 AD* (comic). *Balmer* (the best game in the trilogy). *Sevenson's World*. *Hydrocol*. *Mono* and many more besides. Even these days they prove as popular as ever.

So there you have it. It's good that a format that's been around for so long is still being done so well. For example, *Quaxter 2* the latest in the classic series. In fact that's a very good example, so good that I'll use it in the comparison. As for an older isometric game well there's only one choice really, it has to be *Head Over Heels*. So the games are on the table, the stakes are high (the dinner is in the oven). How do they compare?

I fully. *Head Over Heels*. The game was written for the Spectrum by Ian Hume and Simon Osmond. Two those names are familiar, they're the same people who brought us the original *Berman* game, as well as *Match Day* and *Match Day 2*. After the success of *Berman*, the two amazingly produced a game that was even better by using the excellent idea of letting you control two

characters rather than one. The characters are named? Why Mr. Head and Mr. Heels of course. The twist was that the two of them (yes it was a *cute* game) had been separated by the evil Blacktooth and locked away for good. Their task? To escape, meet up, liberate 2 planets, capture Blacktooth's crown and escape to the planet freedom, where they come from.



Head Over Heels

Easy? I think not. After buying the game I spent about 2 hours a night playing it (in the good 2 weeks (longer or weekends). This game ruined my social life, damaged my sanity, made me pull out my hair in frustration, but I completed it. There's enough puzzles to keep even a *Mono* member like myself going for ages.

Oh, and back to that twist, there's the benefit to be gained from "controlling" the two pals too. You see Head can jump a long way and change direction in mid-air, but he's slowpokes. Heels is speedy enough, but pretty crap in the jumping department. Time is needed to master controlling the two of them, but that's not all you need to do. For when the happy chappies get together their powers combine. To put it nicely Head sits on Heels's head, and the two of them join together as one. This makes all

parts of tasks a whole lot easier and so on.

To sum it up, undoubtedly the best ever game for the Spectrum. More challenging than something very challenging indeed, and more addictive than Colombia Bay! Buy! Buy! Buy!

But wait! This isn't a review, it's a comparison! Ozo-Gauntlet?

Now, if you haven't heard of the Gauntlet series of games then you don't actually exist. It's as simple as that. After the popularity of the two strangely shaped pseudo-warships (called Gauntlet and Gauntlet 2 respectively) computer versions were inevitable, and equally popular.

They did, however, do about every thing double with the overhead view format, so when Gauntlet 3 came along it kicked up a bit of a ruckus with its usage of the 3D computer game format.

The game is basically similar to the original, but nearly all the aspects have been taken further. There's the extra dimension for a start. Also you now have eight characters to choose from, rather than the original four (now known as Neptune, Pallas the Hooligan, and Blue Peter dog). Goblins that trade and Blizzards the imaginatively named ice man, and a plot.

Surely not a plot? Yes, a plot. Cap'n Jack, the Lord of Demay is causing a bit of trouble on the island of Capro, it would seem, so someone has to do something about it. You'll never guess who. Yes it's you, and possibly a buddy if you're lucky enough to have any friends.

The main difference between the two games is how about to drop up at least in HOH, you're puzzle solving most of the time, but whereas in O3 it's much more of your traditional slash-at-everything type of game. Also O3 though made up of 8 different levels, normally only a 3 different degrees, whereas HOH is made up of lots of microlevels, never.

Perhaps, at these points, the particular O3 are much bigger than those in HOH, but that's not a fairer comparison. Actually, now that I came to look at it, they haven't really got much in common at all, except for the 3D aspect. I'm like Ireland.

Well a quick run up. Both games make good use of the 3D aspects technique in different ways, they don't have a lot in common, and so to collapse my grade, I'll say that this was all planned to show just what a variety of games there are of this type. Head Over Heels, obviously doesn't show its age, and neither does Gauntlet 3, because it isn't very old. Thank you. DA

The Manic Miner Competition!

With the release of the new version of the classic game, Manic Miner on the Sam, here's a simply competitive to win a free copy of the game, photographed by its programmer and original look editor of ZAT Magazine! The first prize winner will win the game and a second prize winner will win 5 blank discs.

To win either of these prizes, just answer these eight correct questions.

- 1) Who wrote the original Spectrum version of Manic Miner?
a) Matthew Smith. b) Matthew Hall. c) Matthew Smith.
- 2) Which of these 'screen titles' from the Spectrum version was never used?
a) The Menagerie. b) Return of the Alien Kong Beast.
c) Return of the Jedi.
- 3) Which of these 3 games did the author of MM NOT write?
a) Manic Miner. b) Jet Set Willy. c) Jet Set Willy 2.

Send your answers on a postcard or a sealed envelope to: MANIC MINER COMPETITION, 103 CHILTERN GARDENS, DAWLEY, TELFORD, SHROPSHIRE TF9 5QJ.

Entries sent to this issue must be received by June 30th. Winners guaranteed on ZAT 15.